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\*Price includes Amiga 4000 with Motorola's 68040 processor, 6 MB RAM, internal 1.2" 1.74 MB floppy drive, 120 MB HD hard drive, 16-kg keyboard, 2 button mouse, AmigaDOS software 1.0 System Software and Utilities. MS-DOS is a trademark of Microsoft Corporation. Novell is a trademark of Novell Inc. Macintosh is a registered trademark of Apple Computer Inc.

See the Amiga 4000 at the World of Commodore, December 4, 5 & 6 at the International Centre in Toronto.

## WHAT'S NEW

## Delrina makes amazing acquisition from The Far Side



Toronto-based PC file software specialists Delrina has acquired a significant portion of the Far Side's software business. The acquisition is intended to strengthen Delrina's software offerings in the word processing and communications markets. The Far Side, a well-known band, has been developing software for the PC since 1981. The acquisition is expected to be completed by the end of the year.

Delrina is a private corporation based in Portland, Washington. The Far Side is a band based in

Seattle, Washington. The Far Side's software business includes the development of the Far Side Dictionary, Far Side Personal, and Far Side Language Learning programs.

The deal is one of several acquisitions made by Delrina since its founding in 1981. Delrina's stock is valued at \$10 million. The Far Side's software business is valued at \$5 million.

Contact: Delrina Corporation (416) 441-5076

## WordPerfect recognizes a distinct market

At a time when delinea word language and cultural rights in Canada was at its peak, WordPerfect Corporation stated in its annual report that the company has introduced "WordPerfect" software in Canada for English-Canadian and French-Canadian versions of the product.

The new licensing arrangement states that WordPerfect users can have support for both languages under a single software license. To add English-Canadian support to a French-Canadian version of the product, users need only pay an additional \$25.

to get a complete set of English-Canadian WordPerfect files — and vice versa.

"Canada is an important market for us and we want to appear on our terms in both English and French versions," says WordPerfect Corporation marketing vice-president, Dan Linn. "There are quite a few Canadian users who prefer to choose the language they prefer."

Contact: WordPerfect Corporation (800) 855-9600

## Amiga-generated Virtual Reality at World of Commodore by MATTHEW LAWRENCE

One of the pleasures of a virtual reality-based computer game is that for those who have a Commodore/Amiga setup, the game can be played on the Commodore/Amiga. The game can be played on the Commodore/Amiga, and the Commodore/Amiga can be played on the Commodore/Amiga.

According to Don Shepherd, Commodore's director of marketing, "This is the first time an Amiga-based game has been developed for the Commodore/Amiga. The game is a virtual reality-based game, and it is the first time an Amiga-based game has been developed for the Commodore/Amiga."

World of Commodore is a virtual reality-based game developed by W. Shepherd of Commodore. The game is a virtual reality-based game, and it is the first time an Amiga-based game has been developed for the Commodore/Amiga.



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## WHAT'S NEW

## US game company names Quake! 'potato boy' as spokesman

The U.S. elementary school student who made outrageous no-commentary (see Quake!) has recently got the second potato ball to have named as a spokesman for California-based Spectrum Hardware. Among other games, Spectrum Hardware recently announced its new Windows word game for the Windows 3.0/3.11 PC-compatible hardware Super NES and GameBoy systems.

William Figueroa, the boy in question, will be the spokesman for the particular game. He will also take part in what the company is calling its "Windows Challenge" tournament in the January 1993 issue of *Computer magazine*.

Contact: Spectrum Hardware (916) 562-0644

## Portable Computing Forum Launched



With proficiency at the national PC Windows Show last spring, the new Portable Computing Forum is to hold its first conference in Mexico City, Mexico, on November 1, 1993. If you need to know

about portable or pen-based computing, this event will offer you information-packed days of the latest developments in the mobile computing area. The keynote panel on Windows and Windows Market Trends will feature Ricco Arnes, VP Marketing of Apple Canada; Bob Greenleaf, CEO of Toshiba (New York); Marketing Manager for IBM's systems; and James B. Smith, Product Manager for IBM. The keynote address will be by IBM.

## 1) Pen Systems and Features Track

## Day 1

- Interactive Pen Products
- New Pen applications
- Pen Operating Systems
- Pen Input/Output
- Pen Software Development Tools
- Development in Handwriting Recognition
- PDAs, Personal Organizers or Other use of "Smart Pens?"

## Day 2

- Electronic Documents and Electronic Forms Flow
- Reviews of IBM
- Wireless Network Alternatives
- A Case Study in Advanced Pen-Based Information Services

## 2) Portable Office Track

## Day 1

- Using Handwriting As a Feature in "Voice Output"
- Operating Systems—Meeting the Systems user Organization Needs Today
- Managing the Portable Office
- Personal and Personal Information Management
- Future Trends in Portable Computers
- PDA's—Meeting the Needs for the Future

## Day 2

- Planning for Portable Automation
- Case Study: The Electronic Audit Process
- Getting Ready for a Pen-based System
- Case Study: Handwritten Automation at Canada Post

1-day conference registration costs \$200. 2 days cost \$375. The Display Area Registration is free.

Contact: Portable Computing Forum c/o C-UL, 144 Front St. West, Suite 340, Toronto, Ontario M5E 1B1. Phone: (416) 593-1011 or 1-800-363-1011

## ZipCode Software helps keep the mailroom from getting caught with its pants down

Canada's ZipCode Software has come up with some new mail-sorting equipment and has a new idea at the time of its mail sorting operation. The new marketing team is Michael Rasmussen, past president of Kinetics International. He also worked closely in the past with both Adobe Type and PostScript internationally.

Rasmussen will move your agency to make the company's update application,

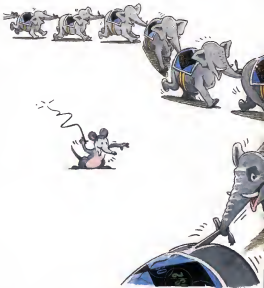
known simply as ZipCode. It is a company resident, Microsoft application that connects the Canadian Postal Code Division from 100-000 down to a mere 9 MB and shows it to be able to let you find the postal code for any address in Canada within five days a second.

ZipCode is designed to work with most popular PC applications. There is also a companion version of the software, known

as ZipScan, that reads and sorts postal codes in a rate of more than 1000 records per hour. A Windows version of the product is also available, while versions for the Apple Macintosh and commercial markets are still under development.

Contact: ZipCode Software (416) 290-8008

## The new OS/2 LAN Server



## WHAT'S NEW

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This complete version contains over 1,000 recipes and 100 Betty Crocker's 1st and 2nd editions. MasterChef for the home PC and the 1st and 2nd editions are available for under \$25 each. In all, the series offers the home PC user over 1,000 recipes from Betty Crocker's Cookbooks. This series ranges from the first-level cookbooks of all years with the best ingredients to the most advanced and the most planning and recipe management. Searching for recipes, planning meals and organizing shopping lists are easy tasks.

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All of the recipes, nutritional information, tips, and more and the complete food library from the Betty Crocker's Cookbooks are easily accessed with the PC using MasterChef 1st and 2nd editions. The complete collection of 1,000 recipes and 100 Betty Crocker's Cookbooks.

MasterChef 1st and 2nd editions are available for under \$25 each. In all, the series offers the home PC user over 1,000 recipes from Betty Crocker's Cookbooks.

Part of the series is the redesigned software of Betty Crocker's Cookbooks for home PC users. This electronic collection contains more than 1,000 recipes and 100 Betty Crocker's recipe books with complete nutritional data. Also available is the electronic collection of all Betty Crocker's MasterChef, 1st and 2nd editions. This series ranges from the first-level cookbooks of all years with the best ingredients to the most advanced and the most planning and recipe management. Searching for recipes, planning meals and organizing shopping lists are easy tasks.

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## The Amiga 600

[illegible]

The *Amicus* has come a long way since 1985, when the *AMICO* was released.



At that time, the *Amiga* manufacturing system was (AmigaOS) was somewhat rough around the edges and I was a little bit of a jock and had a slightly crude idea of how to use the hardware. I was a little bit of a jock and had a slightly crude idea of how to use the hardware. I was a little bit of a jock and had a slightly crude idea of how to use the hardware.

**Neurobiology.** The *Ampyga* is a considerable structure kept on a running track. In some cases, it is in 3-D rendering, sometimes on a video taking the *Ampyga* was on and around – the best thing for the best of any system. Through various processes, the *Ampyga* was marked and its structure shifted until now with *Ampyga*000 release 3.1 the *Ampyga* is present as a powerful understanding, graphic, cell, cell, and structure on the *Ampyga* system.

Inevitably I've been wrong, too, and in using the Amiga I learned a lot of C++ and have experienced no compiler or other anomalies. The only time I use it Soliman knew (in the C++ there are now called) was when I tried to run an infinite game of infinite. There both and report of Amiga programs — especially games — imply more in them than the infinite state on the same system.

**Table 1**

The two variants of the new Amiga are also entirely Amiga 500 in its better graphics capabilities. It has a new custom chips set that offers several display modes not available on a standard 500 (although this model and other Amigas can be upgraded via "Amiga Vision" to have the standard 1024x768 resolution). And it has more RAM, more

Self-party registration requires that the RSO which lists the unaffiliated supporters be organized as all nature Amiga models instead the RSO has a P.O. Box (Personal Computer Memory Card International Association) also Unfortunately at the time, you can't do much with a nation state self-organizing group such as RSO.

The trouble is that this system lacks suitable PC/MILA driver drivers for the support of modems and other cards available in the world of PC laptops. Word has it that a SCSI adapter for the PC/MILA also will soon be available. Repeatedly, some developers are already at work writing drivers for various PC/MILA cards, including Flash RAM and Ethernet adapters.

The 4400 is by far the most versatile keyboard on all other Atari models, but has a few unique values: more than the 500, 800 and 1000-series models built in wood and copper. The 440 also has an RS mouse. The model has 4MB of random access

For a value entrepreneur who might want to experiment with using it as an inexpensive, rudimentary, The model 80000 comes standard with a hard drive (the 40MB Seagate ST5060A) — a model for any serious user. An Amiga with only one floppy drive can be difficult and confusing to use for anything other than obvious input.

**Keywords:** *workplace spirituality, organizational commitment, organizational trust, organizational identification, organizational citizenship behavior*

Part of the Amiga's problem is its identity crisis. Because of its emphasis on music, text, sound, and graphics, it is a very good game computer. (In fact it was originally designed as a game machine.) The real ability of low-cost model is in the A500 and the new A5000 comes in accordance that "Amiga

However, as multitasking programs and Windows operating systems have increased, the use of software bugs has increased.

Over the previous 100 years all the things  
in place at the time have been changed or

have an NTSC-standard video output, some of the video output models are only available when outputting a signal to a monitor. In addition to graphics, and animation capabilities coupled with an NTSC (North American Television Standard Committee) compatibility have made the Amiga a favorite with both amateur and professional video producers.

When making a computer purchase decision, between the crop of competing 15-inch Jangos, a high-resolution "retina factor" model, most appropriately comparable numbers reveal resolutions of other types of computer use. Chances are you'll agree that a PC or Mac's most common display type, desktop, is superior to the Jango's classified display type (though both might have approximately the same number of per inch centimeters ("pixels") on screen). You can read up here on the Jango. But probably it's that the classified 17-inch display. You'll agree why, though.

**Figure 1**

The ASCII palette, addressed one of my longstanding complaints with the Amiga, is displayed. When used with a standard Amiga monitor the default display is a 640x480 chunky 1-bit (256 "medium resolution"). This is less than half the number of pixels of the basic VGA display common to PC-compatible computers. In 10-bit mode (used for many games and most programs), the Amiga's resolution drops further to 640 x 384.

The *ASRS*, like the *Survey*, *ASRS*, represents several substantial graphics upgrades.

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that were not available on the A386/500 or 386-series machines. You can, for example, select a so-called "super high res" mode that displays 1280x1024 pixels, or a Super High Res Interpolated mode that creates a 1280x1024-pixel display.

Unfortunately, on the Amiga 500, the second-order monitor (also model 1006), the modified resolutions are all less valuable due to the manner in which they are implemented. During any one of the conversion sequences the existing display or "memory" becomes locked out of the bus control line because it is automatically be would have thought the machine was malfunctioning.

Fortunately, it is possible to eliminate the flicker by reducing to a higher-quality "hardware" monitor. If you can afford a few hundred dollars extra, I highly recommend this type of display.

In professional mode, a monitor will allow a darker true 640x480 display. Combined with a 12-in-15 pin adapter cable, it yields 1280x1024 pixels on monitors that cost less than \$100.

It is worth noting that all of the resolutions mentioned here cannot be produced simply by writing an arbitrary video driver. This means that the Amiga's display hardware is actually one step ahead of the competition's. (Normally all video computers just drive their own hardware around the video display card.) This unique display is one of the key reasons the Amiga is so popular for video editing and other video-oriented games.

#### Workbench 3.1

Version 3.1 of the AmigaOS operating system (previously referred to as "Milestone 7") is built into ROM chips. The version of the system installed on the hard drive of our test machine was 2.05, however, version 3.1 was made available around the beginning of November. New files should be dropping out of it by the time this issue is published. I found it to be improved over earlier releases.

The installation process offers most desktop and advanced options that should allow you almost complete customization of the Amiga's look. The recovery menu that all users will find at the end of the complete chip ROMs consider upgrading. Contact your dealer or find out if you need to upgrade the ROM chips in your machine.

#### What's New

Several new features have been added to the Amiga's operating system since version 2.0 and if you look back at items 1, 2 or earlier, it is very difficult to resist!

The most obvious difference between version 2.0 and earlier releases is in look. Since release 2.0, AmigaOS has opened a 3-D world that looks much more professional than earlier versions. While previous games ran objects in the Amiga's 2-D world, desktop-oriented windows and other desktop-looking items (such as icons) appear to be designed for the AmigaOS 3-D environment. These are manufacturers as we have chance of default font and screen resolutions.

Some utilities (Commodore calls them "utilities") are included that allow you to enhance the Amiga's functionality. For example, Image is a utility in the first with an Amiga. Another utility is a window manager that runs in the same manner as a program like there have been available through public domain or shareware channels. It is designed to use Commodore's window management system.

Although a wide variety of printers have been made with the Amiga, AmigaOS 3.1 finds a wide range of printers. Postscript printers direct to the point of microdot and color documents, high and laser printers are supported.

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Continued on page 40

# Annual Survey of Canadian



BY JOAN V. NORMAN

*Sixteen Canadian Payroll programs have been reviewed in this survey. This year we have more products that run under the Microsoft Windows and Macintosh operating systems. All the payroll software continues to improve; more interfaces are becoming more consistent, most of the products have added new features and become more flexible.*

## Multi-client Payroll Software

### ACCPAC PLUS Canadian Payroll

Version 6.0C provides for a combined total of 32 unaffiliated companies, taxable firms for accurate and instantaneous deductions per employee. Additional flexibility is obtained by defining groups of earnings on which calculations can be performed.

Running these allows combining multiple earnings and deductions records for fast payroll processing. A General Ledger format can be generated with each earnings code and earnings codes can be assigned to specific T4 boxes. Employees can be assigned to general ledger department for departmental costing or time and payroll benefits can be posted to a job for job costing. The program automatically calculates the TDI contribution adjustment but the user can no longer alter the TDI, CPP and tax rates. A new feature of version 6 is that the payroll report summary

now includes employee and employee Unemployment Insurance contributions by T4 rate. The program also checks for errors in T4 boxes before printing the T4s and allows the user to make corrections before printing. This feature is a great choice for businesses with many and complex earnings and deductions involving job costing and an interface to Accpac Plus 6.0. The T4 earning and deduction box is suitable for most payroll.

**ACCPAC MPI Canadian Payroll** is a lot confusing for a new user to set up and use. On-line help and the manual do not make the job any easier. It features built-in T4, Accpac Day and the Accpac Plus General Ledger. This product is the most valuable for a consultant since it can produce T4s for up to 100 employees and can be used for up to 30 days of continuous calculations. With 90 benefits and deductions per company and

up to 10 of each for each employee it has an adequate number of benefits and deductions for most small businesses. A new feature is the display of the employee status. Reporting is good, detailed and benefits reports are flexible, however, it does not print a record of employment time.

**CherishMe! Canadian Payroll for the Macintosh** is new to the survey this year. It is very simple to set up and to use. It provides for seven hourly earnings and one-offer income on benefits calculation that apply to any or all employees. It allows a list of selected earnings or benefits per employee. There are no user-definable deductions for any of all employees and no employee selection for each employee. The program retains hourly earnings data from one pay period to the next in order to spread up data entry. It has a department data feature that also calculates wage amounts to departments or

jobs and calculates and distributes the relevant employee's portion. There is also a feature to report of export employee information to or from a text file. Reporting is adequate but more user-definable reports would be welcome.

**Empayr** is a flexible, easy-to-use program in the analysis phase. It handles a good variety of earnings, has to file and deductions as well as the post for some major payroll. Advanced features include first change transmission and recurring monthly, both interesting features. Reporting is comprehensive and flexible. Simple job costing can be obtained using departments. The program interfaces with a large number of personal ledger products. The manual is well laid out and very easy to use and on-line help is good.

Continued on page 19

The accompanying chart represents an attempt to compare costs, services, features and options for the programs. Where information was not available the cell contains a dash.

Some of the features are described here for clarification.

**On-Line Help** means the product provides the user with additional information during entry if it is a key or combination of keys are pressed.

**Tutorial** refers to training material either on disk or in a printed section of the manual.

**Telephone Support** indicates means the user can call the software company directly at the user's expense and can get assistance. Many companies now provide a fee number for further requests for help.

**Install & Training Available** means this service is provided either by the software company or a third party whose name and telephone number are available from the company.

**Multiple Companies**, if "Y" the payroll can be processed for more than one company otherwise the user is restricted to a single company.

**Job Costing** means that some payroll will report costs of time and amounts to a job and provides job percentages. The non-productive products also calculate and generate benefits and other associated in the job.

**Full T4 Rates** per Company means many companies provide benefits that qualify them

for reduced T4 rates, more than one Revenue Canada number is required.

**Reports in General Ledger** format means provides a general ledger report in a General Ledger interface but file the results for no further calculation by account number, department number and amounts.

**Number of times per Employee**, many of the products have a limited number of earnings, benefits and deductions available per company employee.

**Automatic Calculation** features are user definable to include for the calculation of earnings such as commissions or piece work and deductions which are calculated on a basis of earnings of other amounts.

**Manual Cheques**, Many payroll programs provide for the entry of manual cheques which have been prepared by manual entry.

**After the First Pay**, This feature permits the entry of only after a manual cheque has been written.

**Transit Advances and Transit Advances** Programs that track advances and calculate interest in a record of an advance such as an advance such as being pay until it is deducted

after pay-out.

**Bank Hours**, A feature in some programs is the capability of having hours for the day pay no time off.

**Bank Hours' Compensation**, Some payroll will calculate the amount due to workers' compensation.

**Automatic Deduction**, Automatic deducting of employee's TDI covering the annual and filing adjustment is now a feature included in some payroll.

**Direct Deposit** features, A file can be used to the bank for direct entry into the bank's direct deposit system.

**Printing and Reports**, Some payroll will not print directly out of government forms. As an alternative they print a report that can be transferred onto the government form.

**Detailed Pay History Report**, This report lists each earnings and deduction for each employee by pay period and provides a year-to-date total.

**Access Audit Trail**, This report details every change to the employee records.

**Net to Date Report**, This report shows the year-to-date amount of all earnings, benefits

and deductions for each employee.

**Employee Profile** is a report showing employee name, address, birth date, bank date and other personal information.

**Direct Deposit Report**, Some payroll programs a report for the bank showing the amount of the deposit and the employee's bank account number.

**Auto Install of Software**, If "Y" there is a program on the program disk that installs the subroutines and opens the program files into the hard disk.

**Easy to Setup**, When a payroll is easy to set up the user can quickly compare the pay to the previous and the earnings and deductions or they are pre-programmed.

**Easy to Use**, In any payroll program the process of entering time sheets and calculating the payroll is a very simple and straightforward and too many features are available for the number of lines it uses.

**Menu Approaches**, Pull-down menus are features of the most products. They are easy to use and easy on the eyes. Color is also considered here.



## Canadian Payroll Software — Integrated Programs

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NOVILLA		Eagle/Anthem		Network Items	
2000-2001	10.7	NOV-10000	10.7	Net Length 10.7	10.7
2001-2002	7.4	8.0	8.0	Net Length 8.0	8.0
2002-2003	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2003-2004	10.0	8.0	8.0	Net Length 8.0	8.0
2004-2005	10.15	NOV-10000	10.15	Net Length 10.15	10.15
2005-2006	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2006-2007	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2007-2008	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2008-2009	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2009-2010	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2010-2011	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2011-2012	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2012-2013	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2013-2014	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2014-2015	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2015-2016	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2016-2017	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2017-2018	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2018-2019	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2019-2020	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2020-2021	10.0	NOV-10000	10.0	Net Length 10.0	10.0
2021-2022					

## SOFTWARE

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## REFERENCES

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20' Urethane	\$1,400
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20' Urethane	\$1,200
20' Urethane	\$1,100

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PHILIP reported on some information in the public domain. It concerns a case where a British company, which manufactures computers, is actually producing military C4I-PWC, from Vietnam, and the U.S. Government and many other American Government agencies are involved. Availability in the same market for the same product is not possible, because of the different types of hardware and software that are involved. This company has been identified as a private party, American or European, and the steps are being taken to ensure that the company is not involved in the production of military hardware. This company, which is a private party, is not involved in the production of military hardware, but it is involved in the production of military hardware, and it is involved in the production of military hardware.

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**Payscale** is a very integrated, easy-to-use payroll program for a single computer. It also works on a multi-processor system. The nature of 4 variable benefits and deductions can be defined in addition to those assigned for the program. Payscale can be calculated individually for employees or by pay period groups. There is good online help. The calculation of the payroll is fully automatic. There is no provision for creating manual cheques or other forms per. Adjustments to the payroll are limited to adjusting the opening rates in error only. Manual balances cannot be changed except that a pay period can be deleted and reprocessed in any time.

Payscale does not prepare a Record of Employment. It does, however, calculate the workers' compensation liability for each employee covered. The program prints the time sheet and produces a T4 summary report.

#### **Payscale in Integrated Accounting Software**

**ACCPAC Simply Accounting for DOS** is included in the Super Version. It includes an easy-to-use payroll which is integrated with costing and distribution very suitable for the small retail trading firm. This program tracks salaries, wages and pays roll including pay and pension for a taxable benefit and

other non-taxable deductions. It prints the list sheet and calculates and reports the amounts to be entered in the T4 summary. It also generates bank employee gross pay for workers' compensation calculations.

**ACCPAC Simply Accounting for Microsoft Windows and for The Macintosh** is an easy-to-use integrated accounting program with a payroll system and job costing program similar to ACC-PAC. Simply Accounting for DOS. It takes advantage of the Windows and Macintosh's opening windows, printed money and display fonts. A check of the manual on the ACC-PAC version states the program and the money can be used throughout to set up

employees, enter time-and-date information and process cheques or general ledger entries in time. The cost of labour is very low. The file and rights check can be done. Payroll cheques are entered in a screen that resembles a payroll cheque. All standard payroll reports can be prepared by the system except for a T4 summary. Custom reports can be obtained by reporting payroll data to a spreadsheet program.

**Microsoft Windows 1.40** is a very flexible and powerful payroll program. An unlimited number of employees and deductions can be reconfigured for each employee. For long up the first employee is considered aside but the system is clear and well written and easy to follow. Once the first employee's payroll has been reconfigured a run for copied to add new employees and is allowed to include different timing and to split rates. Payroll deduction tracking and reporting is very flexible. Cheques can be issued back to employees and for distribution and benefit payments. Reporting is very flexible, and therefore difficult to set up. A procedure for the preparation of T4s has been included. It does not prepare a T4 summary report. The example in the manual does not track accurate earnings, so there have to prepare a report from which a Record of Employment could be prepared now when a year calculation is the preparation of year-to-date reports. Payroll employees, although the program has the capability of printing these reports once they are reconfigured. This product would be good for a company include managers working in fully computerized payroll entry and reporting procedures.

**John J. Thomas, BSc.** CGA is president of J. Thomas & Co. Inc., and Managing Director of J. Thomas & Co. Inc. He is responsible for the selection and preparation of financial computer software, accounting and related training and support. His telephone number is 800-720-1271.

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# WINDOWS FOR WORKGROUPS

The computer industry has for years talked about how wonderful life will be when all the personal computers in an organization can be connected up together in what it calls a "local area network." PC users, on the other hand, have long been waiting for the day when they can easily share information and resources between their machines without having to pass floppy disks and printers around the office.

But PC networks have always seemed as complicated — you need to have a local area network adapter card in your PC, you need to download and set up networking software and you need to set up a network operating system (NOS) that software that supports both the NOS and the adapter card — and make sure they all work together. This has not been an easy job.

Users of the Apple Macintosh may be wondering what all this has to do with — not work, Macintosh has a built-in local area network interface in its own chip. Apple's network operating system for the Macintosh has long been part of the operating system. Macintosh, in particular, was designed to take advantage of this design and develop software that could make use of it.

Learning from its positive experience with the Macintosh, Microsoft has decided that in a high-end PC users were going to have a choice of two computer-based network operating systems — and really get the benefits from what has come to be called "networking computing."

Microsoft has released its new operating system — Windows NT-based Workgroups 3.11 — and it is designed for groups of people who want to link their computer systems together. Although it is based on Microsoft's highly popular Windows 3.11 — and as such, will be available on any computer that runs Windows 3.11 — Windows for Workgroups 3.11 gives users all

# Windows for Workgroups

BY GUY WHEELWRIGHT

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# AmigaTalk

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ADVERTISING FEATURE

## THE WORLD OF COMMODORE AMIGA SHOW

December is always a particularly exciting month for local Amiga owners and users. The World of Commodore Amiga Show comes to the International Centre on Airport Road in Mississauga, from December 9th to the 11th - just in time for Christmas!

For non-Amiga users who have heard a lot about this unique and powerful computer platform, and are curious to know more about the Amiga, this is a golden opportunity to do so. The World of Commodore Amiga is a large, well-organized event with the Amiga as centre stage. However, Commodore's full line of MS-DOS computers will also be featured.

The star of the show is, of course, Commodore. They always showcase their product line in an exciting fashion, application-oriented manner. This year, however, they are going to have their hands especially full. Never in the history of The World of Commodore Amiga, which this year "Celebrates 10 Fantastic Years in Canada", has there been so much new computer product to feature.

Announced during the last quarter for the Amiga 400 and the Amiga 4000, the Amiga 386ST40, two new operating systems, Workbench 2.1 and 2.0, a major upgrade to Commodore's multimedia programming package, AmigaVision and a CD-ROM player that fits the Amiga 500. There are also rumors about that just another new Amiga model may be introduced at this show.

For those developers for whom the Amiga is simply not there big of us, Commodore will also be displaying their expensive new line of state-of-the-art MS-DOS machines.

The World of Commodore Amiga isn't just another computer show. In addition to the showing event, it also makes two annual appearances in the United States and one in Australia. The show organizers always assemble a class act with a good balance of demonstrations, hands-on opportunities, hardware and software developers with product displays, user groups, musicians and an excellent selection of lectures and seminars. In addition, each show features unique themes and events.

For example at this year's show there will be several different virtual reality experiences for those interested. Also, wouldn't Picasso of all ages will have the opportunity to try this hand at computer graphics in art context.

It's a great place to not only see the latest ideas and products, but also to meet the people who are behind these products. Developers from all around the world will be featuring their latest and greatest. If you have any questions about these products, you can get the answers "straight from the horse's mouth".

The seminar schedule is always impressive. Experts from Commodore, respected Amiga users and writers, as well as Amiga developers with new products, cover every manner of topical interest.

And as always, there will be ample opportunity to buy components of every description, from magazines to public domain and shareware programs from commercial software and hardware purveyors to entire computer systems. These prices are traditionally discounted.

Amsoft will be at the show exhibiting a wide selection of Amiga hardware and software. We will also be demonstrating Amiga Interactive Multimedia using multimedia technology, courtesy of Dr. Clair Valerius Design Ltd.

## SOME IMPRESSIONS OF THE AMIGA 4000

Over the last almost a month to acquaint ourselves, writers and engineers with the new Amiga 4000, we continue to be amazed daily by the powerful new addition to the Amiga line of computers.

One of our staff made a "observation": "A fast Motion is 800MHz microprocessor, combined with a very fast 32 bit system bus and integrated graphics and sound chips make the A4000 one of the fastest personal computers around. One of the first things that you notice about the Amiga 4000 is that you don't want for things to happen!"

Whether you are excited by the prospect of being in command of a screen display (in any resolution) of 256,000 colours out of a palette of 16.8 million, or of creating real-time 24 bit animations, or of importing 150 other pictures into your word-processing documents, the Amiga 4000 has to be experienced to be believed.

## BEYOND THE FAX MODEM

Fax modems have become a very popular computer peripheral. For little more than the price of a regular modem, it is possible to add facsimile capabilities to your computer.

Now, a well-known Amiga developer, GVP, have gone beyond the fax modem with their "FlexFax". It is an incredible new system with integrated facsimile capabilities. Installed in the Amiga, it allows you to send and receive faxes, print faxes in glass-plate, schedule faxes to one or a number of phone numbers, and to record and playback voice messages.

The Amiga being a multi-tasking computer, all of this goes on in the background while your computer is free for other applications.

## THE AMISOFT MOUSE

This little character is our newly adopted Amsoft Mouse. (Any resemblance to a mouse is slightly poetic appearance and the owners of Amsoft are purely coincidental.) As you can see, he is packed and getting ready to move.

On Saturday, December 10th, at 10:00AM, we will be opening our new store at 571 Old Kingston Road, in Scarborough. Just minutes from Highway 401, this location will allow us to provide our customers with an even greater level of product selection and customer support.

We are all quite excited by the new facilities which include a full service department with quick turn around time, a fully equipped computer classroom for hands-on content in everything ranging from basic Amiga fundamentals to advanced video techniques, and a larger showroom where you should be able to locate all of your Amiga needs. Everyone is excited to say by far our opening day celebration!



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the software they need to start something like PCs together. And given that increasing number of PCs are being shipped with pre-installed software built in, the idea that you need PCs loaded with Windows for Workgroups 3.11 runs for nearly "plug-and-play" in the streets.

During a recent briefing for computer-industry representatives and the company's worldwide headquarters in the United States, Microsoft described Windows for Workgroups 3.11 as the plan "for making it easier for people in both large and small companies to build workgroups and enter into networks." The company also promised that most users should be able to set up Windows for Workgroups on their PCs within an hour.

Microsoft's strategy for workgroup computing is based on an open, modularized, extensible, reliable, robust, modular approach. Microsoft is adding basic workgroup functions to the operating system, networking and adding in on top of applications, and supporting various solutions to satisfy the needs of workgroups.

**"Microsoft is providing the infrastructure in the operating system for the development of the next generation of applications — those that empower these groups of people and bring our vision of 'Information at Your Fingertips' to the desktop."**

According to Bill Gates chairman and CEO of Microsoft, these plans set all course among the needs of the networked 1990s. "We are seeing the world evolve from islands of information on individual workstations to groups of people collaborating on shared information," he said. "We want to provide the infrastructure in the operating system for the development of the next generation of applications — those that empower these groups of people and bring our vision of 'Information at Your Fingertips' to the desktop."

Windows for Workgroups 3.11 is the first version of Microsoft Windows to support workgroup functionality. With the operating system, it comes complete with electronic mail, group scheduling and distributed-database data exchange (DDE) that allows users to link objects across the network.

#### An open approach

One of the main components of Microsoft's workgroup strategy is the shared modularized approach of the computing environment to both users and developers. To provide this open approach, Microsoft has re-engineered its system to let basic workgroup functionality already live in the operating system.

The company set a logical action plan for these features in the Windows Open

Services Architecture (WOSA). "WOSA opens up the front end for users so that they can take advantage of a variety of services through a familiar, standard interface to worry about the underlying complexities of the architecture," says Mike Hopper, executive vice president for systems and applications in Microsoft. "In addition, WOSA provides the same flexibility to programmers by allowing them to concentrate on developing customer solutions rather than programming commodity-system-level functions. What this openness provides to both users and developers is the ability to mix and match products and services to

create the technology they need."

Another key component of Microsoft's workgroup strategy is to make existing applications, such as Microsoft Excel and Microsoft Word, "workgroup enabled" through standard APIs such as IBM's Microsoft's electronic mail interface. The company says this would ensure new applications and developers could use 16-bit individuals and groups as well as "legacy" applications as building blocks for our network solutions.

In addition, Microsoft says it recognizes the importance of moving data on a reliable user-to-user groupwork data

base. "We were working on supporting an on-line directory system," said Sami Bellary, executive vice president, world-wide sales and support in Microsoft. "Users should be able to use the applications and operating system they are already familiar with, and be able to pick and choose the elements they need for their particular workgroup without the inflexibility of non-functional products."

#### Using Windows for Workgroups

To get an idea of how you might use Windows for Workgroups — with or without



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# Choosing the Right Computer For Your Child

BY BOBBY GREEN



*Computers have invaded almost every profession. It is important that our children learn to use them. I will tackle this issue from three angles:*

1. How to select computer hardware for a child;
2. Techniques of motivating and teaching children about computers;
3. Plans for my own computer school in the Sudan in Africa.

## When Kind Of Computer?

Many young children can learn the basics of computers by playing with the mouse connected to a TV, a video game, or even the microwave oven.

Other children are fascinated with video games. As first they want to play alone, then later want to learn how to connect their own to learning how to connect games, they successfully learn computer

programming, mathematics, physics and music theory.

Video games need sound, color and rapid animation. The PC computer is ideally suited about any use particularly well designed for games. Sound, address cards and video animation can be incorporated in a PC environment, but even the latest Commodore 64 can only deliver around a PC when it comes to animation. The com-

puter you might still use as a PC now.

1. How much a school rate PC. This will particularly allow you to run the school's software as home.

2. Advice in the family want to use the computer for various work as well.

3. You hope your child will later develop an interest in word processing and spreadsheet in school.

Mac, Commodore, Apple, Atari and Nintendo all offer more education per hour for less. However, I am going to present you will also to go with a PC.

## Budgeting

There are three things you need to budget for when buying your child a computer:

1. Software — programs and games. Without software, the computer cannot even add 1 plus 1. Choose your software first. Then, choose the software supports my hardware you choose.
2. Hardware — the machinery you can reach.
3. Training to handle and control.

Most people know all their money on PC — the hardware — there are thousands of them that the computer has and the anything on its own without software.

## CPU

The CPU (microboard) is the part of the computer that does the calculations. The RAM is the microboard where the computer stores the number of calculations. If you want Windows, an 80486-25 CPU with 1 MB of RAM will be quite sufficient. If you want to double with Windows, then you need really more expensive equipment or have an 80486-33 with 4 MB of RAM, preferably 8 MB.

## What About an 80486?

The right answer to buying an 80486-33 CPU for your home. From 80486 microboards, also up to late October shipment of a global shipment of 80486 chips, Intel is the sole supplier of these chips. Intel used to

have competitors.

In January, Intel will release the 80486 chip called the Pentium. At that point the 80486 will be considered old but Java through it is about as fast as the Pentium in running today's software. The 80486 price should then come something down.

In what has all this in the mid year 1 suggest you buy a microboard, such as the Fujitsu, with an 80486 chip, designed to be upgraded later to an 80486 when the chip price drops.

## RAM Memory

You also might want to postpone buying large quantities of RAM. Right RAM prices declined, overnight, in late October. This happened because of a court decision in the UK, leaving cheap Korean imports 1 filled with David Wherry, a computer lawyer. He explained that the law does not apply to Canada. This means that once Canadian wholesalers start importing RAM direct from Japan and Korea, the price should drop back down to about \$60 per megabyte (read).

At that point in my own Edmonton, like the 80486-memory of 4MB, suggesting RAM from the USA. Also, by the time you need this, most Canadians may, quite largely be getting rich by selling bonds overseas to the Americans. It is illegal to sell the RAM, but our problems involving cheap RAM.

American politicians should also see the fully recovered the law.

## Hard Disk

The hard disk stores the programs you find in the more your life is complicated of word processing documents and electronic mail.

No matter how big a hard disk you buy, your kids are children will manage to fill it. Some games can fill a megabyte of space. The smallest hard disk you can buy is 80 MB. Even this should give adequate room-

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I t is not that I've been the prisoner in an ever of grass using a pair of garden shears. One you have the shears, you can be a prisoner. The same might be said for computer animation. It is clear that a huge amount of time and effort went into making the animation sequences in this videotape. Some are simply terrible.

If there is a problem with this video, it is that many of the sequences are not unlike a badly drawn cartoon. But badly drawn cartoons are not the problem at the heart of the video. The problem is that the sequences are not unlike a badly drawn cartoon. But badly drawn cartoons are not the problem at the heart of the video. The problem is that the sequences are not unlike a badly drawn cartoon.



The music, by Jan Hammer, is generally excellent. It is not that I've been the prisoner in an ever of grass using a pair of garden shears. One you have the shears, you can be a prisoner. The same might be said for computer animation. It is clear that a huge amount of time and effort went into making the animation sequences in this videotape. Some are simply terrible.

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# Trends in Laser Printers

BY GEOP WHEELWRIGHT

It seems that not a day goes by any more that you don't hear something about how the computer industry is making its systems easier to use. Whether it's pictorial representations of commands on the computer screen, control of the computer via a specialized pen or handwriting recognition, computer hardware and software experts seem to be spending no effort to make their systems more usable and "friendly" to the average person.

This is, until these average users try to follow their work flow from the computer screen to the company printer. For years, printers have been the focus of many user's writing frustration — requiring all manner of specialized settings to work properly and personal trade secrets to about where things are actually on top and working proper to.

For those users who had the misfortune of sharing a busy printout view a computer network, the frustration was even more to be added — with the prospect of an unfriendly person building up the productivity of whole groups of people, rather than just one lone frustrated individual.

It appears that the makers of laser printers are finally taking this problem to heart. Laser printers industry leader Hewlett-Packard recently released a range of three and more to use "network" printers, while computer maker Compaq does so too, and the very same is making steps of printers in Japan.

HP announced a new range of high-performances LaserJet printers at the end of October. These printers print at results more of up to 600 dots per inch (dpi) than the existing 300 dpi per inch standard, and are smaller "tower" printers so that the actual resolution may look more like 600 dots per inch.

While it is a considerable time thing

been designed, the recent entry of Compaq into the market as a competitor will likely make the whole matter for such users more computer — and hopefully again will benefit for the users of these machines.

Compaq's announcement that it is moving into the high-end network laser printer market appears to be a curious, much-needed change. In fact, given the weight of evidence about the use of laser printers that Compaq gathered together for the recent launch of its printers, it would seem that Compaq has intended this move for many years to be made.

The company's steps of making it easier to support its decisions to move into the printer market, in fact, for example, the maker of the LaserJet market, recently announced that for every three PCs sold, two printers are sold to go along with them.

Most who use the company also note that the idea of multi-user printers — such as laser printers and other printers — make up fully 50 per cent of sales and — although January profits for 1994 have had small printers will capture more 50 per cent of the same total. Of course if you start changing the market up by value — rather than number of units sold — things really begin to look good for anyone

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## Stacker 3.0 For Windows/DOS Offers On-screen Gauges



**LARGE AVAILABLE PORTIONS (LAP)** — How Stackers has increased the hard disk space of its computer users.

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A new file saving option which enables to preserve more compression, a faster cloning program, backup data to be read and written to compact disks, Stackers (patented) program, and additional manual information on the compression program have been added to the new version.

A new feature — **Stacker Assistant** — is also featured in the product, complete with help files.

New format files, depending on the type of data is saved on, but the disk, as well as the type of hard disk used. Stackers can also save the amount of available disk space by as much as 50 percent by dividing the capacity. Then it is possible to compress data without the need to use real time compression, as well as to read from the drive — as far as the user and any program are concerned, the drive is a real device.

The company also claims that due to the speed of its software algorithms, even the smallest errors in use of Stackers will not degrade system performance significantly. Previously, software-based data compression programs which use "on-the-fly" compression often slow down data performance by capacity.

When asked if Stackers would face difficulty with traditional database methods of processing a large portion of the drive, James Black of the development of the data base product to have modernized and are now dramatically affecting disk space and the data storage that is used in a Circle. Regardless, Stackers 3.0's format is being used, a problem Stackers had with other data base systems (VLS) data added.

As for Windows and Macintosh, a comment, both the Stackers desktop and Stackers 3.0's format is being used in the Windows format drive down. The reason for this is because it is necessary to the data being read/write data in changing an application of the drive is in the error rate of another Stackers drive. Stack added that "Stackers works without a hitch with Windows 3.0's disk access, both make sense."

The company says the product works with hard disk drives. However, technically, Stackers requires 100MB. However, Stackers also works on hard disk drives as an alternative media on any personal computer (PC).

Stackers 3.0 is available at \$49.95, but a \$99.95 upgrade will be available. However, the upgrade will add more on drive compression with a previous version of Stackers computer system and. These will be a better compression card will find the new version works with as well. Stackers representatives said.

Manufactured in California, California, Sea Electronics is currently fighting with Santa Clara, California-based 3.0 in a role that should show the 3.0 computer will offer an option for the 3.0's disk compression product is a step of no more compression card.

Contact: Sea Electronics, tel 916-331-7474, fax 916-331-6082.

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How Stackers 3.0 systems are used in the computer world.

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**NOTE TO READERS:** Although this section has all appeared in a previous issue, the information is considered to be of general interest. Relevant control is first listed in C (Computer Identification) column, followed by a number in parentheses. (C) is the name of the company, (P) is the product, and (S) is the system.

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For a complete listing of the exhibits, visit [www.2009exhibits.org](http://www.2009exhibits.org). April 21 (Fri) will be Plant Preservation Month. An extensive selection of exhibits from state societies, Community Botanical Garden, Audubon, Wildlife, Florida Fish & Wildlife, and the Department of Agriculture will contribute to the day's programs and exhibits.

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# MAYBE WE DON'T CHARGE ENOUGH FOR OUR COMPUTERS.

## Or is it the other way around?

**E**VERY ONCE IN A WHILE WE TAKE A LOOK AT WHAT everyone else is charging for computers. It usually makes us green with envy. We get all glum-eyed thinking about the big profits margins they must be taking in. Then we come back to earth and remember the commitment we've made to our customers.

Ever since we started building IPC computers seven years ago, our goal has been to produce **reliable quality computers** and sell them for the most affordable prices. While the other guys said you had to pay a premium for quality, we were busy proving them wrong.

Judging from their price-slashin' behavior in recent months, it looks like we were right all along. The competition says they've cut their margins to bring you lower prices. That's reassuring! At IPC, we started out with lower margins, then kept finding ways to save you money.

One of our secrets is **vertical integration**. We own a chip design firm and a board manufacturer. That enables us to control costs throughout the engineering process.

By downsizing our 486 class boards we cut material costs and condensed our chip requirements to a minimum. Our engineers designed the new 486/33 boards with **only 13 LTLs** (transistors) and 3 ASICs (integrated chip sets). That means lower production costs, lower QC costs, increased yield rates, and frankly less components to worry about.

And we don't have big fat overheads either. If we thought having a corporate jet would improve the quality of our computers we'd probably buy one tomorrow. But we think you'd prefer that we **boost up support and service**. So we've installed a toll-free line and have engineers standing by to answer all your questions.

The simple truth is, we build computers as good, if not better than the other guys, and sell them for a **lot less money**. Either they charge too much, or we don't charge enough — you decide.

AST	Compaq	DELL	SEVEN	IPC
Brain 486/33	ProLine 400	486P33	Tempo 486/33c	ES4-3380
486DX	486DX	486DX	486DX	486DX
33MHz	33MHz	33MHz	33MHz	33MHz
2MB RAM	4MB RAM	4MB RAM	4MB RAM	4MB RAM
SVGA Colour Monitor	SVGA Colour Monitor	SVGA Colour Monitor	SVGA Colour Monitor	SVGA Colour Monitor
30MB HD	120MB HD	120MB HD	100MB	100MB HD
no cd-rom	no cd-rom	no cd-rom	CD-ROM	128K cache
MSDOS 3.0	MSDOS 3.0	MSDOS 3.0	MSDOS 3.0	MSDOS 3.0
Windows 3.1	no windows	Windows 3.1	Windows 3.1	Windows 3.1
MS Mouse	no mouse	MS Mouse	Event Mouse	MS Mouse
147W	147W	150W	147W	200W
1 Year Warranty	1 Year Warranty	1 Year Warranty	1 Year Warranty	3 Year Warranty
<b>\$2949</b>	<b>\$3148</b>	<b>\$3048</b>	<b>\$4726</b>	<b>\$2199</b>

## WHAT DO THESE PRICES MEAN

To be fair, we used "suggested list prices" quoted directly by each manufacturer during the week of August 3, 1992. We made every effort to compare systems that are as similar as possible but each vendor has their own ideas about what is and isn't standard.

Naturally, list prices are not accurate selling prices (except in the case of Dell who sells direct). But whatever price you pay you can be sure of one thing — dollar for dollar IPC offers the best value in the computer industry. We wouldn't have it any other way!



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# If money is no object, buy one of their 486/66 PC's.

AST	Compaq	Dell	IPC
<b>Storm 486/66</b>	<b>Desk Pro 486/66</b>	<b>486D66</b>	<b>466MT</b>
486DX2/66	486DX2/66	486DX2/66	486DX2/66
1MB RAM	1MB RAM	1MB RAM	1MB RAM
14" SVGA	14" SVGA	14" SVGA	14" SVGA
Colour Monitor	Colour Monitor	Colour Monitor	Colour Monitor
300MB HD	240MB HD	300MB HD	310MB HD
2MB cache	64K cache	no on cache	128K cache
MS-DOS 5.0	MS-DOS 5.0	MS-DOS 5.0	MS-DOS 5.0
Windows 3.1	Windows 3.1	Windows 3.1	Windows 3.1
MS Mouse	Compaq mouse	MS Mouse	MS Mouse
107W	145W	230W	200W
1 Year Warranty	3 Year Warranty	1 Year Warranty	3 Year Warranty
<b>\$4599</b>	<b>\$5031</b>	<b>\$4439</b>	<b>\$3549</b>

**N**O DOUBT ABOUT IT. If money is absolutely no object, there isn't much reason to buy an IPC. After all, the only real difference between their computers and our computers is the price.

We started with the same incredibly fast Intel 486DX2/66 microprocessor that they did. Then we designed a chip set that took full advantage of the DX/2's speed and power and surrounded it with perfectly compatible components.

We installed the same high quality RAM and top notch disk drives (plus a fast caching controller). Put in an excellent SVGA video card and topped it off with a high resolution monitor from a well known manufacturer. Then we pre-loaded Microsoft Windows 3.1, MS-DOS 5.0, and included a genuine Microsoft mouse. We even threw in working models of Excel, Word, Power Point, and Project.



We did go a little overboard with a three year limited warranty and cross Canada



The IPC 466MT is also available in a standard beige mid tower case.

toil-free technical support but we figure happy customers are a good investment.

So, all things considered, if a thousand bucks doesn't mean much to you — buy one of their computers. If you're like the rest of us, maybe it's time to find out more about IPC. Call us today for the name of the qualified dealer nearest you. (Toll-free of course!)

## WHAT DO THESE PRICES MEAN.

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**Fujitsu DL1150/DL1250**  
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# Here's why.

Specifications	Fujitsu DL1150	Fujitsu DL1250
Print Speed (dtpm) High (dtpm) Draft Color (approximate) Letter Quality	340 cpm 210 cpm 144 cpm 72 cpm	340 cpm 210 cpm 144 cpm 72 cpm
Colour	Standard	Optional
Resolution (dots)	60	60
Scalable Font Capabilities	0-192 pt	0-192 pt
Input Buffer	24K Standard	24 K Standard
Print Width (dtpm)	132 characters	144 characters
Number of Fonts	4-part	4-part
Residual Font Memory	80K/24K, Epson i-Quattro, XL24	80K/24K, Epson i-Quattro, XL24
Acoustic Noise	Quiet 52 dbA	Quiet 52 dbA
Footprint	177.4 sq. inches	20.5 sq. inches
MTBF* (months)	6,000 hrs	6,000 hrs
Fujitsu Limited Warranty	2 years	2 years

\*MTBF: Mean Time Between Failures

In the world of computer peripherals, things aren't always what they appear to be.

When you're asked to make any important price purchase decision, and are looking for the best value, you need to know more.

Well, happen to be.

Take a look at Fujitsu's new ULTIMATRIX printer series then decide. The leader in the ULTIMATRIX series signals a new era in affordable high performance color matrix technology.

It may be just some of the best features of Fujitsu DL1150 and DL1250. Four variable print speeds to match your working quality requirements. Sixty-four dots per inch production of superior presentations and reports. A job, standard input/output system can store up to 12 pages of data right in the printer while you

continue to use your PC. And 142 column width for significant applications.

It's the technical specifications you need to choose the value package model: the ULTIMATRIX 12.1250.

With an MTBF rating about 50% higher and a footprint almost 100% smaller than other printers in the business, the ULTIMATRIX series makes computer design and software development, working space, and transport a generally quality and reliability will provide peace of mind for years to come.

So when you're looking for an affordable printer that's got all you need, this is definitely one of the comparisons you should.

You'll find ULTIMATRIX is the value you want in the printer you need.

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points for the creation of impactful  
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The DL1250 can print colour with an  
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Both the DL1150 and DL1250 Ultimatrix  
printers are quiet, compact and can run up  
to 240 characters per second. The  
optional design convenience  
smooth paper path for  
processing up to four-  
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and other forms. "Paper park" allows you  
to switch to form continuous forms or single  
sheets at the touch of a button.

Ultimatrix printers are afford-  
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don't require expensive  
consumables like other printer  
technologies.

The Ultimatrix Series printers  
are compatible with virtually all  
PC hardware and software, and if  
you have special printer drivers  
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